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ABSTRACT

This report analyzes how the Texas higher education system will meet the needs of future health care professionals. The report examines: (1) medical education needs (physician supply, physician distribution, medical schools' responses to physician distribution, and distribution of medical schools and regional academic health centers); (2) national and state nursing education needs; and (3) allied health professions needs (the view from the community, rising degree requirements, and student transferability of credit). The Council for AID to Education presents its conclusions to the Texas Higher Education Coordinating Board. The report notes the importance of recognizing the strong connection between health professions education issues and changes in the health care financing and delivery system. It also finds that while the supply of Texas physicians is sufficient overall, the supply is inadequate in certain areas; it suggests that the severity of the prospective nursing shortage must be assayed, and strategies must be designed to respond to it; and it suggests that more descriptive information about allied health professions education is needed if coherent policies are to be developed. Appended is a primer that describes the allied health professions and their education for an audience outside the field. (SM)

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RAND

Looking to the Future: Health Professions Education in Texas

Richard Rettig

DRU-2307-CAE

June 2000

Prepared for Texas Higher Education Coordination Board

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PREFACE

The Texas higher education system faces severe challenges in responding to the twin demands placed on it by economic growth and by the increasing problems of access to higher education that many Texans experience. This report presents the results of analyses of how well that system will meet the future needs for health care professionals, including for physicians, nurses, and allied health professionals. This study was conducted in parallel and informally coordinated with the Task Force on Health Professions Education established by the Texas Higher Education Coordinating Board Planning Committee. However, the work reported here reflects the independent analysis and judgment of RAND researchers.

A companion analysis addresses the question of how well the higher education system in Texas will likely meet the challenges of the future if current trends and patterns continue. It identifies the kinds of changes needed to realign higher education in Texas with these challenges. We present the results of that analysis in a separate report, *Achieving the Texas Higher Education Vision* (Roger Benjamin, et al., 2000, RAND: Santa Monica, California, DRU-2305).

This research was funded by the Texas Higher Education Coordinating Board. It is part of a larger body of research on the challenges that face higher education across the United States conducted by the Council for Aid to Education, an independent subsidiary of RAND. Further information on the Council for Aid to Education can be obtained at:

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CONTENTS

Preface.....iii

Tables.....vii

Section

1.INTRODUCTION

2.MEDICAL EDUCATION.....3

Physician Supply 4

Distribution of Physicians 6

Medical Schools' Responses to Physician Distribution 9

Distribution of Medical Schools and the RAHCs 10

Implications for the Coordinating Board. 13

3. NURSING EDUCATION.....15

The National Picture 15

The Texas Situation 17

Implications for the Coordinating Board 19

4. ALLIED HEALTH PROFESSIONS.....21

The View from the Community 22

Degree Creep 25

Student Transferability of Credit 26

Implications for the Coordinating Board 27

5. DATA ISSUES AND CONCLUSIONS.....29

APPENDIX: ALLIED HEALTH PROFESSIONS EDUCATION: A PRIMER.....29

Definitions 29

General 30

The Drivers of Change in Allied Health 31

Allied Health Education 32

Allied Health Faculty and Research Needs 34

The Allied Health "Regulatory" World 34

The Allied Health Marketplace 35

Health Care Professions Error Management and Quality Improvement 36

Health Policy Needs 39

DATA ISSUES.....42

CONCLUSIONS.....**Error! Bookmark not defined.**

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TABLES

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1. INTRODUCTION: HEALTH PROFESSIONS EDUCATION IN TEXAS

This report on health professions education has been prepared by RAND as partial fulfillment of its contract with the Texas Higher Education Coordinating Board (CB) to assist in planning for the future of higher education in the state. Health professions education in this report includes the education and training of physicians, nurses, and allied health professionals.

Concurrent with awarding RAND this study, the Coordinating Board also convened a Planning Committee to assist it in developing a statewide plan. In turn, the Planning Committee established a Task Force on Health Professions Education. These two health professions efforts--one by RAND and the other by the Task Force--although conducted in parallel and informally coordinated, are contractually separate. This report reflects the independent analysis and judgment of RAND researchers.

The purpose of RAND's study of health professions education has been to identify some of the most important issues that the Coordinating Board will face in the next five to ten years in the education of physicians, nurses, and allied health professionals. The time and resource constraints of the study contract and the open-ended nature of the charge led RAND to be highly selective in this effort. Visits were made to Austin in November 1999, January 2000, and February 2000 to meet with Coordinating Board staff and representatives of the Texas Medical Association, Texas Nurses Association, and others. The February visit allowed us to attend a meeting of the Health Professions Education Task Force of the Board's Planning Committee. The focus of the RAND effort was a March 6 conference in Austin, which brought together health professions educators from across the state in a meeting that addressed nursing education, health professions workforce data needs, medical education, and allied health professions education. This report, as will be evident below, has also benefited from the many studies that have been conducted recently by different Texas organizations, both governmental and nongovernmental, on various aspects of health

workforce, distribution of health professionals, and health professions education.

The Coordinating Board's agenda in health professions education is complicated because issues arise from three intersecting areas:

- The *health care system*, which is undergoing rapid and profound change in all dimensions, including finance and cost containment, quality assurance, and access to care, especially for uninsured and underinsured populations.
- The *health education system*, which is very complicated in its own right, embracing associate, baccalaureate, post-baccalaureate degree programs and of 2-year, 4-year, and graduate institutions. Health education is also seeking to respond to tumultuous change in the market for health care services, while at the same time seeking stability and integrity in the fulfillment of its teaching, research, and patient care missions.
- *Changes in Texas*, which are independent of health services and health education, include a rapidly growing and demographically changing population, anticipated economic growth and development of high-tech industry concomitant with high unemployment and poverty, the dynamic interaction of Texas and Mexico in the border areas, and eventual shifts in political representation and power.

The responsibility for managing change in health care and health education is not clearly assigned to a single accountable agency, either at the national level or in Texas. Rather, responsibility is distributed--or fragmented--among many parties, public and private, state and federal. Complications arise in this fragmented environment, then, because some--but not all--health systems issues are educational, and some--but not all--health education issues will come to the Coordinating Board. Moreover, some Texas issues may appear to be health education issues but may actually mask health system issues of access. It is necessary, therefore, to discriminate among those issues that

pertain to the Board, and which it can effectively address, and those that are the responsibility of others.

This report is organized in five sections, dealing respectively with medical education, nursing education, allied health professions education, data needs, and major conclusions.

2. MEDICAL EDUCATION

Medical education confronts a number of challenges in Texas as it does elsewhere in the country. These include determining the number of graduates desired each year and translating that into the number of new students accepted annually; establishing the balance between undergraduate and graduate medical education; striking a balance between primary and specialty care in graduate medical education; and responding to a changing health services market. Medical schools in Texas, which are either public or publicly supported, must also respond more directly to the health needs of the state and its citizens than is true for private institutions.

In this context, the Planning Committee's Task Force on Health Professions Education addressed four areas: participation; success; workforce; and technology.[1] *Participation*, which might also be described as access of minority students to undergraduate medical education, is being addressed through various outreach programs of medical schools. *Success*, which pertains to the graduation rates of those admitted to medical and dental schools in the state, appears to be satisfactory. *Technology* refers to the use of telecommunications for meeting health needs (i.e., telehealth and telemedicine), primarily in underserved rural areas, and including the financing of line charges and reimbursement of medical and health services, continuing medical education, and the special needs of caring for burn, trauma, and critical care patients. Technology is receiving careful and continuous

[1] Texas Higher Education Coordinating Board, Planning Committee, Task Force on Health Professions Education, *Recommendations from the Subcommittee on Medicine and Dentistry*, February 3, 2000.

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attention for its current benefits, potential applications, and associated costs in medical education.

The *workforce* area is where the most significant policy questions arise, although these are not unrelated to participation. Four related issues confront Texas in the next decade, and probably the decade beyond, that link workforce and medical education. These are the adequacy of the total number of physicians in Texas; the distribution of these physicians by specialty, geographic area, and underserved population; the role of medical schools in responding to these distributional issues; and the implications of these three issues for the total number of medical schools.

How are these issues linked? Specifically, how are questions about the number and distribution of physicians, and medical school responses to them, linked to the number of medical schools needed in Texas? The issues of physician supply, physician distribution, and medical school responses are not new issues. The Texas Medical Association, for example, has standing committees on physician workforce and distribution of health services. However, the issue of the number of medical schools occupies a unique place in the policy discussion--it is simultaneously off the table and, on the other hand, discussed *sotto voce*.[2] All these matters are continuing issues that require sustained policy and management attention from all parties to the discussion--medical educators, the physician community, the Coordinating Board, the Legislature, and the executive branch of Texas state government.

Physician Supply

A Texas Medical Association (TMA) analysis supports the view that the supply of physicians in Texas is adequate through 2005 at the aggregate level.[3] The number of licensed physicians in Texas grew from slightly less than 12,000 in 1973 to 32,101 in 1998, far more rapidly

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[2] Monica Maldonado, "Fight to the Finish: The race to be the new medical school on the border heats up," *Texas Medicine*, December 1999, pp. 62-67.

[3] Texas Medical Association, *The Physician Workforce in Texas: Implications for Medical Education*, Austin, 1999 (hereafter TMA, *Physician Workforce*).

than the 64 percent growth in population (from 12 million to 19.7 million) that occurred in this same period.[4] TMA projects a net average annual increase of 1,055 in the number of physicians, which yields an estimate of 37,587 through the year 2005 and compares to an estimate of requirements of 35,973.[5,6] These estimates assume the continued availability of a supply of nurse practitioners and physician assistants (although not on a one-to-one basis), without whom the estimated shortfall would be some 9,000 physicians. The ratio of the total number of Texas licensed physicians in 1996 was 158 per 100,000 population; this increased to 162 per 100,000 by 1998. These figures compare to 195 non-federal physicians per 100,000 population for the U.S. for 1997.[7,8]

Texas achieves this supply of physicians in two ways: by training its own new doctors and by the migration into Texas of physicians trained in other states other countries. The following figure [Figure 4, TMA Physician Workforce, p. 8] shows all *new licensees* from 1984 through 1998, including *endorsements* of those individuals licensed elsewhere and granted a Texas license by reciprocity and those admitted to practice as a result of passing the Texas licensing *examination*.[9] The *annual average* for all new licensees was 2,179; those licensed from another state averaged 1,098; and those licensed by in-state examination, 1,048.[10] For the 1994-98 period, graduates of Texas medical schools accounted for 86 percent of in-state licensees.

The annual average of new licensees for 1994-98 by location of medical school was: 831, in-state; 1077, out-of-state; and 589, foreign. Foreign medical graduates account for 2,054 licensees in the 1996-98 period or an annual average for these three years of 684. Graduates of Texas medical schools constituted 33 percent (or 4,155) of the 12,485 licensees in the 1994-98 period.

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[4] TMA, *Physician Workforce*, pp. 5-6.
[5] Texas Medical Association, CME Report 3-A99, p. 8.
[6] TMA, CME Report 3-A99, pp. 9-10.
[7] TMA, *Physician Workforce*, p. 15.
[8] Find comparative ratio source.
[9] TMA, CME Report 3-A99, p. 17.
[10] These data and those following are from the Texas Medical Association and are based on data from the Texas Board of Medical Examiners. TMA, *Physician Workforce*.

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Of the 32,101 licensed physicians in Texas in 1998, 90 percent were engaged in direct patient care and 44 percent in primary care; 18 percent were women, 10 percent Hispanic, three percent Afro-American; and 92 percent practiced in urban areas and eight percent in rural areas.

Distribution of Physicians

Although general agreement exists within Texas that the overall physician supply is adequate, the distribution of physicians has stimulated substantial discussion relative to specialty, geographic area, and population. The balance between primary care and specialist physicians was the subject of great concern in Texas, as in the rest of the country, in the mid-1990s. In 1995, a task force of the Department of Health and the Higher Education Coordinating Board, responding directly to the Legislature, addressed the number and proportion of primary care physicians in Texas.[11] It concluded that there were too few primary care physicians in Texas and recommended the adoption of the national criterion of a 50-50 split between primary and specialty care physicians as the normative target for the state.

A number of initiatives have been undertaken to increase the number and proportion of primary care physicians practicing in the state. These have included the state supported training programs, beginning in 1977, for community physicians, promotion of health careers among high school students, preceptorships for medical students, family practice faculty development, and residency programs for family practice and primary care. State supported practice programs have involved fairs to recruit physicians to rural areas, primary care physician registries, loan repayment programs for primary care physicians and physician assistants, and other efforts. There have also been a number of federal government funded training and practice programs.[12] The data indicate that Texas has moved toward its target goal: primary care physicians

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[11] *Physician Work Force Strategy for Texas, A Report to the Subcommittee on Health and Human Services and Education of the House Appropriations Committee*, February 1, 1995, prepared by the Texas Department of Health and Texas Higher Education Coordinating Board.

[12] TMA, *Physician Workforce*, pp. 44-46.

increased from 40 percent in 1990 to 44 percent in 1998; they accounted for nearly 45 percent of the total in 1999.[13] Specific deficits still exist, however, in orthopedic surgery, family practice, and internal medicine.[14]

A second concern has been the distribution of physicians by geographic area, especially in rural areas but also including inner cities and the Texas-Mexico border area. The Center for Rural Health Initiatives published its biennial report in early 1999, which makes clear that the issues of rural health are very complex and include access to resources and information and to trained health professionals, and finance and reimbursement, and beyond personal health involve public health and population-based issues and community education and economic development.[15] There are 196 rural counties in Texas, which account for 15 percent of the population; 62 of these are frontier counties with seven or fewer individuals per square mile; 175 entire counties are designated as "medically underserved areas" and 48 are partially designated; and 113 counties are designated as "health professional shortage areas," with 47 counties partially designated.[16]

The Center report recommends that recruiting primary care physicians "be recognized as a most significant problem" and that communities be helped to retain them. Two recommendations propose the development of *locum tenens* relief services for primary care providers in rural areas. The rest of the 25 recommendations go beyond these cited here.

There are several limitations of the Center's analysis. For one thing, Texas--as most states--has not developed an analytical model for defining rural areas that is independent of the federal government. As the federal definition is used to establish programs, a dependence on the federal government has been created. Consequently, the pending redesignation of Health Professional Shortage Areas and Medically

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[13] TMA, Physician Workforce, p. 9.

[14] TMA, CME Report 3-A99, p.11.

[15] Center for Rural Health Initiatives, *Rural Health in Texas, 1999: A Report to the Governor and the 76th Texas Legislature*, Austin, Texas, January 1999. [Hereafter *Rural Health*, 1999.]

[16] *Rural Health*, 1999, pp. ix, xxi, and xxii.

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Underserved Areas will mean loss of federal funding for various programs. The problem has been recognized in the report: the absence of a set of state-determined *normative criteria* for designating rural areas with health professional shortages or medically underserved areas led to the recommendation that Texas develop "a state-level set of designation criteria" to assist rural areas in maintaining eligibility for "necessary programs and services." It further commends legislative efforts to develop a uniform definition of "rural" that would apply to rural health services and recommends that this effort continue. A politically determined Texas definition is essential for guidance to administrative agencies and to medical schools seeking to fashion programs that respond to an identified need.

In two other respects, the report falls short of an adequate analysis. It makes no reference to the expectations for health care of individuals and families who voluntarily choose to live in rural areas. Although some may be trapped in rural areas by factors beyond their control, many who choose to live there must be regarded as having made rational and voluntary choices about the bundle of benefits and costs, including government services, that follow from their personal choices of residential location.

Finally, Texas rural health programs tend to involve the top-down provision of resources and services. An alternative approach that might reinforce such efforts and promote decisions by physicians to live and work in rural areas is to encourage "demand-oriented" efforts at the community level. Such a "demand-oriented" (or bottom-up) approach might provide modest grants to communities wishing to define their needs for physicians, physician assistants, and nurse practitioners, and indicate their willingness to offer economic incentives and other amenities to health professionals willing to locate in their communities. Such incentives and amenities might include loan repayment, provision of housing, and similar items; but the bundle would be defined by the local community as a bidder for the services of health care providers.

One limiting factor to such a bottom up approach is that there are more data available on physicians trained in Texas than on those who migrate into the state. Bidding for the services of the latter may be

difficult. The Texas Medical Licensing Board obtains data on all individuals who receive their M.D. degree or their residency training at Texas institutions, but very few data are obtained from physicians migrating to Texas, either from other U.S. states or from other countries, especially about locational preferences. A one-page questionnaire attached to the Board of Medical Examiners application when the request for a reciprocity endorsement is submitted might provide this data. This information could then be provided to underserved communities so that they may "advertise" their willingness to provide economic incentives to those choosing to locate in their communities--housing, debt repayment, or other economic or social amenities.

Medical Schools' Responses to Physician Distribution

Medical schools are in a relatively weak position to influence directly the decision of medical students to live and work in rural or medically underserved areas. They are able to influence the distribution between primary and specialty care career decisions to some extent. Even there, however, they are limited by the personal preferences of individual medical students and residents.

Some efforts to affect the distribution of physicians in underserved areas have focused on the diversity of the physician workforce. Medical students recruited from minority communities and from rural areas are more likely to return to such communities and areas to practice. This is an area where medical schools can exert some influence on physician distribution, albeit indirectly. In those areas where the problem is mainly high concentrations of indigent and uninsured populations, however, medical schools are weakly situated to provide needed health services without an external subsidy, either federal or state.

Medically underserved communities and populations of Texas, in addition to low-density rural areas, include the areas along the Texas-Mexico border and the inner cities of the state. Here, however, the issue of physician distribution shades into the problem of responding to indigent, uninsured, and underinsured individuals. Technically, such

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areas may not have an inadequate number of physicians, but their populations may face a limited ability to pay for health services. In turn, these limits threaten the provider institutions, such as academic health centers, to which these populations turn for care. Texas Medicaid severely limits eligibility and covered services, exacerbating the access to care issue stemming from insurance limits. On the other hand, arguments that Texas Medicaid should do more must confront the moral hazard problem of the border areas: the more provision is made for health care for the underserved populations of these areas, the greater will be the incentive for migration across the border.

Distribution of Medical Schools and the RAHCs

A different Texas response to the distribution of physicians and health services has been the creation of regional academic health centers (RHACs) in geographic and population underserved areas. Most of the Texas medical schools are located in the state's major urban areas, thus reinforcing the existing distribution of health services. The distribution of medical schools and health professions training institutions is basically historical, which is to say that their location resulted from reasonable decisions at the time of establishment. Any mismatch between current location and the distribution of population is arguably a defensible accident of history.

However, major population growth in the state is generating pressure for additional medical schools. The focal points of pressure for expansion are the set of regional academic health centers (RAHCs) that exist or are being established in El Paso (Texas Tech University), the Lower Rio Grande Valley and Laredo (University of Texas), and Corpus Christi (Texas A&M). The policy issue is whether these two-year RAHCs should be expanded over time into four-year medical schools.

At the present time, a polite consensus exists among medical educators in Texas that no new four-year medical schools are needed. However, three institutions--University of Texas, Texas Tech University, and Texas A&M--have or are forming two-year regional medical schools in the Lower Rio Grande Valley, Laredo, El Paso, and Corpus Christi. These

institutions are seen by some as nuclei for one or more four-year medical schools within the next decade or two.

A recent article in *Texas Medicine*, the publication of the Texas Medical Association, described the moves occurring on the chessboard of Texas medical education.[17]

- The Texas Tech University School of Medicine was created in 1969 as a multi-campus institution with headquarters in Lubbock and two-year regional campuses in Amarillo, El Paso, and Odessa. (It was renamed the Texas Tech University Health Science Center in 1996.) In August 1999, it announced its intention to transform its El Paso two-year School of Medicine into a four-year institution over a 10-year period. The El Paso campus trains about 100 of the third- and fourth-year students on the Lubbock campus and approximately 170 residents in 10 fields.[18]
- Previously, responding to a 1997 legislative initiative, the University of Texas System, through the UT Health Sciences Center at San Antonio, had established a Regional Academic Health Center (RAHC) in South Texas (in the Lower Rio Grande Valley) in Brownsville, Harlingen, and McAllen. UT also agreed in 1999 to an expansion of the San Antonio campus to Laredo, contingent on the local donation of land and construction financing (which was forthcoming).
- Texas A&M Health Science Center has proposed the Coastal Bend Health Education Center in Corpus Christi. The center would include fourth-year medical training as well as training in nursing and allied health.

Common to all these initiatives is advocacy by legislators from each of these areas. Medical educators appear less enthusiastic about new medical schools but confront a complex need to respond to legislative interests, to protect existing institutions, to engage in defensive moves relative to competitors, and to address genuine needs for physician and health services in underserved areas and populations of the state.

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[17] Maldonado, pp. 62-67.
[18] Maldonado, p. 66.

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The view one adopts about whether one or several new four-year medical schools are needed in Texas is a function of how the issue is framed:

1. Is a new medical school a way to compensate for problems associated with the distribution of physician and health services?

2. Is it a means to provide a more equitable distribution of health education institutions, and thus a higher probability that its graduates will remain in the community?

3. Is a medical school an engine of economic development or a way to ensure economic growth of the area, especially in leading-edge science and technology-based industries?

4. Is one's view of the issue informed by looking backward (in time) at the progress in Texas medical education and a desire to ensure that the quality of existing institutions is maintained? Or is it shaped by looking forward at the demographic changes that are forecast for Texas' population?

Regardless of one's view, the issue of new four-year medical schools is unlikely to be foreclosed in the immediate future. If anything, it is likely to increase in salience. The key policy question is this: What factors should be considered in the next decade as medical educators, the Texas Legislature, the Higher Education Coordinating Board, the Department of Health, and other institutions, consider the possibility of creating new four-year medical schools?

In the May conference at which this issue, among others, was discussed, Dr. Carol Aschenbrenner laid out an analytical framework for consideration.[19] In the hope that the discussion can proceed from the same set of questions being asked by legislators, educators, and citizens of Texas, we present that framework in terms of the ten questions that Dr. Aschenbrenner believed should be faced when making such a decision.

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[19] Presentation of Dr. Carol Aschenbrenner, transcript, "Looking to the Future: Health Professions Education in Texas, The Next Decade—or Two," Austin, Texas, conference organized by RAND under the auspices of the Texas Higher Education Coordination Board, March 6, 2000.

- What is the need?
- What evidence is there that a new medical school would meet the need?
- Is a new medical school the most effective way to meet the need?
- What resources will be needed to create a new medical school?
- Will a new medical school increase the net number of Texas graduates?
- What is the targeted level of quality for students, educational programs, and clinical services?
- What new demand for clinical services might be stimulated by a new medical school?
- What new educational opportunities might be seized by a new medical school?
- How will a new medical school be supported financially in its initial years and as it faces the need for continued revenues?
- What are the realistic potential benefits to the city and region of the new school and how long will it take for these benefits to materialize?

Implications for the Coordinating Board

What are the implications of the above analysis for the Coordinating Board? The total supply of physicians in Texas appears to be sufficient for the population of the state, at least through 2005. The distribution of physicians within Texas, however, reveals some inadequacies. In specialties, shortages appear in orthopedic surgery, operating room, emergency room, and intensive care services. However, number and proportion of primary care physicians in the state is certainly in better relation to specialists than at the beginning of the decade. In geographic terms, there is substantial concern for availability of physicians in rural areas. Inner-city populations and underserved minority populations have also received attention. The problems of the latter may stem from the incidence of an indigent population and one without adequate health insurance. This conundrum of issues is potentially a source of future policy controversies.

The Board, and all interested Texas governmental and non-governmental agencies and organizations, should monitor the demographic development of the state closely. At some point, however, complicating the process, the redistribution of population will result in an redistribution of political power.

The Board should pay close attention to the distribution of physicians throughout the state, both for the merits of that issue and for the implications for the number of medical schools. This monitoring effort should give greater attention to the in-migration of physicians to the state than it has in the past, in part as an effort to influence the location of such physicians. If the total number of physicians in the state of Texas is adequate, that fact weakens arguments for a new four-year medical school (or schools). If the distribution of physicians is adequate with respect to geography, population, and specialty, that also weakens arguments in favor of new medical schools. If the distribution of physicians is inadequate, and existing medical schools--in concert with other appropriate bodies in Texas--are able to respond in ways that markedly improve the distribution, that undermines arguments for new medical schools.

If, however, there is inadequate distribution of physicians and the response by medical schools and other responsible parties to this distribution is inadequate, that may strengthen the arguments for new medical schools. Under such a scenario, demands for a medical school may actually be proxies for demands for better distribution of physicians and health services.

Independent of medical school response to maldistribution of physicians, and the corollary maldistribution of health services, if political pressures to create new medical schools increase, it then will become necessary to identify the factors that should considered in making such a decision. Those factors have been set forth in the Aschenbrenner questions. The Legislature should be strongly encouraged to request the evaluation of these questions by the Coordinating Board before it mandates the creation of any new four-year medical school.

3. NURSING EDUCATION

A shortage of well-trained nurses confronts the country and the state of Texas. This section of the report presents the national nursing shortage picture and considers the Texas situation. It also addresses strategies for responding to the shortage, especially those that are likely to confront the Coordinating Board.

The National Picture

The March conference heard Peter I. Buerhaus, Ph.D., R.N., then at the Harvard University School of Public Health and now the Valerie Potter Professor of Nursing Economics at the Vanderbilt University School of Nursing. His analysis focused on the shortage of Registered Nurses (RNs). Buerhaus began by noting that the nation faces increased demands for health care from a population that is growing, aging, and living longer, and that these demands will be strongly reinforced by the retirement of the baby boomers slated to begin in 2010. Thus the impact of this increased demand for services will begin to be felt forcefully in the 2010-2020 period.

The demand for trained nurses derives form the demand for health care in general, and thus it can be expected to increase as well. The 1980s saw growth in nursing employment and inflation-adjusted earnings. This growth slowed in the 1990s as managed care became more widespread and, in the four-year 1994-97 period, real earnings for RNs actually decreased. Nursing employment in home health care grew rapidly in the 1990s, but plummeted in the wake of the Balanced Budget Act of 1997.

Since 1998 there have been increasing reports of a shortage of RNs in all regions of the country and in specialty care units--the operating room, emergency room, and intensive care units. Separating the supply problem into short- and long-term shortages, Buerhaus identified the factors affecting short-term supply of nurses as the presence of an older adult in the household; wages; spousal income; age of the RN; and job satisfaction. Where an older adult, usually a parent, lives in an RN's household, this dampens labor force participation as the RN,

usually a woman, spends substantial time caring for the older person. Wages affect participation directly, increasing participation as they move up, and indirectly by how they compare to comparable occupations and available opportunities. Spousal income strongly affects participation: as spousal income, and thus family income, rises, participation is diminished because total family income exerts a greater direct effect than nurse wages. The older an RN, the lower the participation as nurses withdraw from the labor force. And as satisfaction increases (or decreases), willingness to work is directly affected.

The long-run supply of nurses is affected by nursing faculty, wages, career preferences, and the size of age cohorts. Nursing faculty are aging and many face retirement soon, thus creating the likelihood of a serious bottleneck in the training of new nurses. The effect of wages on participation will be judged in relation to their growth over time, their relation to inflation, and in comparison to other occupations that are available.

In this respect, one of the greatest challenges in obtaining an adequate supply of nurses is how a nursing career compares to other career opportunities. (A profound effect of the women's movement has been to make many opportunities available to women, thus increasing the competition of nursing for recruiting women.) Finally, the age cohort from which nurses are drawn historically is substantially smaller than in prior years.

The most critical variable is the aging of the RN workforce, which according to Buerhaus is the most rapidly aging occupation in the U.S.

- The average age of employed RNs increased by six years from 1980 to 1996. The estimated increase in average age from 1995 onward is one-third of a year. The only comparable aging is seen in teachers.
- In 1980, 25 percent of RNs were under age 30; in 1996, the proportion had fallen to nine percent.
- The drop in nursing of those under age 30 was 35 percent compared to a drop of five percent in the general population.

- The proportion of RNs above 40 years of age began to outpace those under 40 in 1993.

Projections of RN supply and demand lead Buerhaus to estimate a shortage that ranges from 200,000 to 400,000 by 2020. A precise estimate is not as important as the direction and magnitude of the anticipated shortfall. These shortages are expected to begin appearing in ten years, a product of the collision of need driven by an aging Medicare population and a shrinking workforce. Specific shortages, found in all regions of the country, are in ICUs, operating rooms, and recovery rooms.

The increasing demand for nurses as a function of growing demands for health services, and the prospect of an unprecedented shortage of RNs, obviously poses a serious challenge to nursing education. Buerhaus briefly addressed this challenge, noting that the analysis of the national picture had dealt essentially with a nursing workforce that was predominantly female and not fully representative of minority populations in the country. Thus, one aspect of the challenge is to open the nursing profession to men and increasing numbers of those from minority communities. This observation provided the introduction to three panelists representing various aspects of Texas nursing.

The Texas Situation

Three commentators at the March 6 conference highlighted various aspects of the nursing shortage in Texas. Dr. John Crossly, Vice President of Nursing Operations, M.D. Anderson Cancer Center, Houston, discussed the situation confronting his institution. Last year, M.D. Anderson employed 1,200 RNs and had 200 vacancies; this year it employs 1,400 RNs and still has 200 vacancies.

The Texas Medical Center, of which M.D. Anderson is one major center, has initiated an effort to develop a 50-year workforce plan and Crossly reported on four nursing initiatives within this plan. These were the development of basic demographic data on nursing; the examination of demands on nursing education; the collective recruitment of nurses to the center; and general recruitment to the nursing

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profession. His remarks underscored the acute shortage, the limited data, and early-stage strategic thinking about how to respond to it.

Dr. Carolyn Gunning, Dean of the Texas Women's University School of Nursing, posited three nursing workforce goals: to increase the total number, increase the diversity, and increase the number and proportion with advanced education. She argued that Texas should strengthen existing programs, not create new programs. The former strategy was more productive, whereas the latter mainly redistributed nursing students and reduced filled nursing faculty. In 1992, 44 programs had enrollments of 8,870 compared to 50 programs in 1998 with 6,786 enrollments. She called for more coordination within the Coordinating Board between the divisions of Universities and Health-related Institutions and Community and Technical Colleges on this issue.

Gunning noted that nearly 3,500 qualified applicants to nursing programs were not admitted in 1998. This indicates a strong potential for recruiting new nurses, even when allowing for double counting in the pool. Budgeted nursing faculty positions were identified as the principal capacity constraint in the acceptance of new students. In addition, the absence of competitive faculty salaries and the limited pool of qualified potential faculty were other constraints. These constraints pointed to nursing faculty as the bottleneck in responding to the nursing shortage, and all of them required more resources for resolution.

Dr. Paula Mitchell, Head of the Nurse Associate Degree Program, El Paso Community College, reported on her experience. In the border city of El Paso, 50-80 percent of the student population is Hispanic, and typically ranges in age between 28 and 35 years. Retention, not recruitment, is the principal short-term problem. Students have academic deficiencies, reading and mathematics being major ones, which require remediation. They also often have personal, family, and economic problems that complicate completion of academic studies. Recruitment is receiving sustained attention, however, in the form of outreach programs to high schools and middle schools. Counselors are key individuals in the effectiveness of such efforts.

Independent of the conference, a report on Texas nursing is currently being developed, of which the first installment is now available.[20] The general findings of this report were these: the Texas ratio of RNs to population is "well below" the national average; to match the national average of nurses to population in 1998, Texas would require 39,000 more RNs; the ratio of RNs to population for all nursing specialties in the border region is "great and unmet"; wages for RNs have increased only slightly between 1994 and 1998; RN employment in hospitals has not declined and some nurse specialties have had increasing vacancies; RNs in Texas are aging and withdrawing in large numbers from active participation in the workforce; minorities are underrepresented in the nurse workforce; and "nursing graduates are decreasing, and nursing schools' applicant pools are shrinking. The faculty in nursing schools is aging, and the capacity of the schools for developing more nursing professionals has been diminishing."

Implications for the Coordinating Board

What are the implications of the above analysis of nursing education for the Texas Higher Education Coordinating Board? Broadly speaking, how should the Texas Higher Education Coordinating Board view its responsibilities in nursing education? In the first instance, it should recognize the prospective challenge of the nursing shortage, both nationally and in Texas, and equip itself to address this challenge.

In addition, the Board should address and answer the following questions in the months ahead:

- What analyses, if any, should the Board undertake to obtain a clear estimate of nursing needs in Texas in the next five, ten and twenty years? Should it rely upon the analyses of others?

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[20] Donald R. Miller, *Health and Nurses in Texas: The Supply of Registered Nurses: First Look at Available Data*, A report of the Nurse Workforce Data System, Texas Nurses Foundation, in partnership with Texas Institute for Health Policy Research and the Center for Health Economics and Policy, University of Texas Health Science Center at San Antonio, Vol. 1, No. 1, Winter 2000.

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- What data needs exist, to which the Board might devote time and resources, which would help it understand nursing workforce needs? What analytical models are needed to help the Board respond to nursing workforce needs?
- Should Board-approved efforts be directed to increasing the number of Texas-trained nurses through existing schools and programs or through new schools and programs?
- What numeric targets, if any, should be adopted for increasing the number and type of nurses over what time period?
- What objectives should the Board adopt regarding the mix of Texas-trained nurses in terms of ADNs, BSNs, MSN and Advanced Practice Nurses, and nursing doctorates?
- What strategies exist to stop the decline in nursing enrollments? What strategies exist to increase the number of new entrants to nursing schools and programs? How might greater numbers of minorities and men be recruited to the nursing profession?
- What are the needs in nursing education for clinical training and how adequate are existing clinical training resources?
- What objectives and strategies should the Board consider regarding the need for increased numbers of nursing faculty?
- What are the implications for nursing education of increased demands for equity in the distribution of health services in rural and underserved areas and populations? How do these impinge on nursing schools and programs and on nursing education opportunities?
- What are the current, planned, and potential efforts to meet nursing educational needs by distance learning? What studies have addressed distance learning in nursing education? What studies are needed?

4. ALLIED HEALTH PROFESSIONS

Allied health professionals fulfill many important non-physician, non-nurse functions in the delivery of health care services. They account for an estimated one-third of the 10.5 million health care workers in the United States, or over three million workers. Some 200-300 different occupations and professions are included in a broad definition of allied health.

One problem confronting allied health, however, is that many individuals who are otherwise very familiar with health care remain relatively uninformed about the allied health professions. The history of the definition of allied health, for example, is several decades old, involves the U.S. Congress grappling with how to establish supporting federal government programs, and continues to evolve as a function of changes in the clinical and technological bases of medicine.

Therefore, in organizing the March conference, a primer on allied was prepared for an audience of policy makers outside of allied health by Drs. Marilyn Harrington and Richard A. Rettig, which is included as an appendix to this report.[21] The purpose of this primer was to begin to sketch a descriptive account of the allied health professions that would enable quick access to an understanding of the issues in this critical areas of health and medicine by a broader, policy-oriented audience that one identified mainly with the professionals in the field. The document is called a "primer" because it attempts to provide simple, but comprehensive description, of a complicated domain.

The issues identified in the primer include the definition of allied health professions, the overall size of these professions, their number and type, the drivers of change, in particular, cost containment and technological innovation, the educational diversity, the regulatory morass, and the churning health care marketplace. All of these factors are pertinent to understanding allied health.

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[21] Marilyn S. Harrington and Richard A. Rettig, "Allied Health Professions Education: A Primer," March 2000.

In this part of the report, we discuss three subjects. "The View from the Community" presents the perspective of allied health professions educators, especially those who worked on the Coordinating Board's Health Professions Education Task Force. The second and third areas reflect specific concerns of the Coordinating Board, one with "degree creep" and the other with transferability of student credits from two-year to four-year institutions.

The View from the Community

Dr. Harrington, Dean of the School of Allied Health, University of Texas, San Antonio, and a member of the Health Professions Task Force, spoke to the definition of allied health in terms of what it is not. It is not medicine, it is not nursing, but it is "the rest of the gang" in health care. One consequence of weak definition is that the identity of allied health professionals is blurred.

Of the more than three million allied health professionals in the U.S., nearly 300,000 were employed in Texas in 1998 according to the Texas Bureau of Labor Statistics.[22] These are listed in 30 occupational categories, of which the three largest groups are orderlies and attendants at 44,115; home health aides at 43,000; and paraprofessionals and technicians at 37,250. But the list also includes 7,360 dental hygienists and 15,340 dental assistants; 10,410 medical and clinical laboratory technologists and 9,370 medical and clinical laboratory technicians; 13,080 pharmacy technicians and aides; 6,450 speech-language pathologists and audiologists; and 270 electroneurodiagnostic technologists.

The drivers of change in allied health include various factors. Managed care has altered relations among providers, including allied health professionals, and between providers and patients. Cost containment places pressures on employers to find the lowest-paid qualified health professionals professionals. Technological change in medicine defines new occupational categories in allied health, as it

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[22] Texas Bureau of Labor Statistics, Appendix to Marilyn S. Harrington and Richard A. Rettig, "Allied Health Professions Education: A Primer," March 2000.

does in physician and nursing specialties. In addition, changing information technology is both creating new occupations and professions and altering the ways in which health and medical services are provided. And quality assurance and improvement, including error management, places additional requirements on downstream job performance as well as on the training that allied health receive in their upstream educational programs.

Allied health professionals are educated in academic health centers (eight percent of graduates), vocational-technical schools (10 percent), community colleges (31 percent), and four-year institutions (36 percent).[23] In the entire U.S. there are 5,000 accredited programs in 3,000 different institutions. In 1996, there were 233,000 allied health graduates in the U.S. Educational programs range from short courses leading to a certificate to doctoral programs, including associate and baccalaureate degrees along the way. In Texas, in 1998, there were 358 allied health programs, 13,600 enrolled students, and slightly more than 7,000 graduates.

The allied health professions confront a regulatory maze that is incredible. Lacking the autonomy of medicine and the coherence of nursing, allied health faces a bewildering number of educational accrediting agencies and an equally daunting number of individual professional licensing bodies. These bodies are public and private, federal, state and local, and vary from one allied health profession to another. There is little rhyme or reason to the variation, or little rationale for the different health services roles of the various professions, and virtually no analysis of the relation of professional competencies to the health care outcomes that they are intended to promote.

There are nine accrediting bodies in allied health, unlike the single bodies in medicine, nursing, and pharmacy. The largest is the Commission on Accreditation for Allied Health Education Programs

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[23] Presentation of Dr. Marilyn S. Harrington, transcript, "Looking to the Future: Health Professions Education in Texas, The Next Decade-or Two," Austin, Texas, conference organized by RAND under the auspices of the Texas Higher Education Coordination Board, March 6, 2000.

(CAAHEP), which was created in response to the withdrawal by the American Medical Association from this function. CAAHEP represents 18 different allied health professions and over 2,000 different institutions and programs. But specialized accrediting bodies exist for occupational therapy, dietetics, dental hygiene, dental laboratory technology, audiology, speech/language, physical therapy, radiology technology, nuclear medicine, and clinical laboratory science. In addition to the nine accrediting bodies, there are regional and state regulatory bodies. There are internal bodies within educational institutions (curriculum committees, registrar's office requirements, and regents' requirements). There are also requirements that stem from the Texas Higher Education Coordinating Board, whose two divisions have somewhat different agenda and do not always communicate well with each other.

These regulatory bodies tend to focus on processes, not on health outcomes. They usually reinforce narrow specialization and further fragment allied health. They often link accreditation of educational programs with the licensing of professionals. No accreditation without licensing is the battle cry. Absent the separation of these two functions, Dr. Harrington did not expect much creative thinking or research about the competencies specified by licensure and their effects on patient outcomes. The "standards" that emerge from this fragmented process are not always in the best interests of the patient; more often they define the best interests of the relevant professionals. Sometimes the absence of regulation is noteworthy. In Texas, clinical laboratory scientists are unlicensed. Yet they are engaged in critical diagnostic functions, such as cross-matching blood, providing the material for diagnosing cancer, AIDS, and other diseases.

Micromanagement of educational programs and institutions by regulatory bodies is common. Specification of number of faculty by type is frequent. Storage space limits are sometimes cited as flaws. The Texas legislature recently required use of a "safe needle" to control blood-borne pathogens, yet such needles are unsafe when used in dentistry.

The emergence of proprietary educational institutions was identified by Dr. Harrington as a major development that challenges state-funded institutions. They are able to respond more rapidly to a changing market than public institutions and they lie beyond the reach of the agencies that regulate public or non-profit institutions.

Finally, the increasing demands for assuring the delivery of quality care to patients, including the reduction of clinical errors, highlights the absence of integrated training of allied health professionals with doctors and nurses. Education of health professionals is "silo-based," not "system-oriented." The ability of health providers to supply on-the-job, team-oriented training of physicians, nurses, and allied health professionals in quality management and improvement and overcome the limits of narrow professional orientation has yet to be demonstrated.

The Dean of Health Sciences at Austin Community College, Ms. Cecile Sanders, presented the perspective of a community college allied health program. Creating new programs to respond in a timely way to changes in the health care marketplace remains difficult, although the Coordinating Board has simplified the procedures for new program approval. Regulatory agencies are process oriented and highly prescriptive. Outcome measures, where they exist, are often not achievable and impossible to track. Connecting training programs across two-year and four-year institutions ("articulation" in the argot) is especially difficult in fields such as imaging, where new modalities continue to develop. Shrinking clinical training sites, faculty shortages, and data needs for workforce decision-making were also cited as important concerns.

Degree Creep

A current concern of the Coordinating Board is that some allied health professions are steadily raising the degree requirements for graduates. This matter was discussed by Dr. Marshall Hill, the Associate Commissioner of the Board for Universities and Health-Related Institutions. The objective of increasing degree requirements is usually that the doctorate be the required degree for entry to the

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profession. This reflects, on the one hand, the growing scientific, technological, and clinical content of many allied health professions and their manifest desire to reflect a changing knowledge base in the training of their professionals.

However, the requests to the Coordinating Board for the approval of new doctoral programs, in particular, are not always accompanied by a compelling educational or health rationale. Moreover, the costs *per student* increase markedly as the training progresses from the baccalaureate to the master to the doctoral level. The total costs to the state increase very substantially in cases where the degree requirement is abruptly raised from the master's level to the doctorate level. The opportunity costs to Texas of funds spent for training an allied health professional to the doctoral level versus training more mathematics and science teachers must be weighed, but there is no clear metric for doing so. Without raising the presumption that the degree creep is unwarranted, which Hill refused to do, the Coordinating Board does need to receive clear and standardized justifications from allied health programs in the requests for the degree upgrading of programs.

Student Transferability of Credit

Another concern of the Coordinating Board is with the transferability of student credits in allied health education programs as they affect students in Texas. Academic credits transfer most easily; these credits are earned in two years in a community college and basically qualify as lower division years for the baccalaureate degree in a four-year institution. The difficulty arises in workforce education programs, which encompasses many if not most educational programs of the allied health professions. Institutional credit for remedial or developmental courses typically involves no credit transfer.

The transfer of workforce credits from a two-year associates degree program is difficult as the technical career path in allied health, for example, does not often extend into the four-year institution. Students sometimes face difficulty in these in transferring credits even within the same discipline or field of study and may be required to repeat lower division work. They are thus sometimes discouraged from seeking

four-year degrees. Data from a hastily conducted survey, with two-thirds of community colleges responding, suggest that perhaps two-thirds of credits of allied health students transfer as either technical or elective courses. The issue, however, remains to be clarified.

Implications for the Coordinating Board

What are the implications of the above analysis for the Coordinating Board? The first is the challenge of developing descriptive data on allied health that facilitates the understanding of these professions and their educational needs by an audience of policy makers who are not intimately familiar with them in advance. This challenge confronts the Coordinating Board, the Legislature, and all other government, not-for-profit, and for-profit organizations involved in health and health education. The primer points the way to this descriptive data but must be recognized as rudimentary at this point.

Absent a more comprehensive information base from which to develop policy, the fragmented nature of allied health and allied health education will mean that decision making will be characterized by incremental, piece meal responses to very specific and highly local considerations. Decision making will be similar to an automobile trip between major cities that is aided only by a detailed street map of one of them. Broad policymaking, characteristic of a trip organized by a map of appropriate scale, will be effectively ruled out.

A piece meal, small-scale approach to decision making would be acceptable if the allied health professions were not important to the delivery of health and medical services. The implicit lesser status of allied health relative to medicine and nursing should not blind policymakers to the importance of allied health professionals as increasingly integral members of a health or medical care team. The pressures of cost containment on health care will not diminish in the future. Nor will technological innovation in health and medicine diminish. Allied health professionals, already important for their sheer numbers and range of professional roles, will only increase in importance in the future.

A second implication pertains directly to the Coordinating Board. Will it assume leadership in generating an adequate data base for policymakers outside the immediate concerns of the Board staff? Or will it yield to pressures to persist in a piecemeal, incremental approach to allied health? The answer is unclear at this point.

Third, will the Coordinating Board address the issue of regulatory reform of the accreditation and licensing policies, procedures, and practices that affect allied health educational programs and professionals? In order to respond to this challenge, the Board would probably require the endorsement of the Legislature. In our judgment, that endorsement and support should be sought.

However, it will be asked whether regulatory reform is a quixotic pursuit, a fool's quest. The answer is that such an effort, although not easy, is far from hopeless. Texas is a large state, with political, economic, and educational resources of consequence within the U.S. political system. It could undertake a "go it alone" strategy directed to defining an optimal regulatory system in the next several years for, say, the three to five most important allied health professions. Resistance to such an effort would be met at the national and regional levels, and some resistance would emerge within the state. But allies are also likely to appear, especially within the state, especially if purpose and approach were clearly spelled out. An alternative to "go it alone," but one not inconsistent with that approach, would be for Texas to enlist New York and California in such an effort.

In any event, the major choice before the Coordinating Board is whether the present "system" is deemed adequate as a basis for small-bore decision making or whether a broader, more coherent, more comprehensive approach would generate a sound basis for policy development. The latter, we believe, is needed if allied health education is to respond effectively to a rapidly changing health care system.

Appendix

ALLIED HEALTH PROFESSIONS EDUCATION: A PRIMER

By Marilyn S. Harrington and Richard A. Rettig

This primer has been prepared to describe the allied health professions and their education for an audience outside this field. It aspires to raise policy issues through this description, both for those within allied health, in health education, and in health policy in general.

Definitions

The "definition" of allied health has evolved over a lengthy and complex history and reflects more than anything else the changing nature of health care in recent decades. The term "allied health" was apparently first used by staff of the Department of Health, Education and Welfare in the development of the Allied Health Professions Training Act of 1966.

The most recent definition of allied health is found in the Health Professions Education Amendments of 1992, which illustrates the definitional complexity of the term.

> Section 799, E. (5) The term 'allied health professionals' means a health professional (other than a registered nurse or physician assistant) -- (A) who has received a certificate, an associate's degree, a bachelor's degree, a master's degree, a doctoral degree, or postbaccalaureate training, in a science relating to health care; (B) who shares in the responsibility for the delivery of health care services or related services, including -- (i) services relating to the identification, evaluation, and prevention of disease and disorders; (ii) dietary and nutrition services; (iii) health promotion services; (iv) rehabilitation services; or (v) health systems management services; and "(C) who has not received a degree of doctor of medicine, a degree of doctor of osteopathy, a degree of doctor of dentistry or an equivalent degree, a degree of doctor of veterinary medicine or an equivalent degree, a degree of doctor of optometry or an equivalent degree, a degree of doctor of podiatric medicine or an equivalent degree, a degree of bachelor of science in pharmacy or an equivalent degree, a degree of doctor of pharmacy or an equivalent degree, a graduate degree in public health or an

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equivalent degree, a degree of doctor of chiropractic or an equivalent degree, a graduate degree in health administration or an equivalent degree, a doctoral degree in clinical psychology or an equivalent degree, or a degree in social work or an equivalent degree.

Often, as the above language indicates, allied health is defined by what it is not. It is not medicine, dentistry, nursing, osteopathy, optometry, pharmacy, podiatry or veterinary medicine.

General

Collectively, the allied health professions include more than 3 million individuals and comprise more than 60 percent of the entire health care work force in the U.S. The Texas Bureau of Labor Statistics lists 296,685 active allied health professionals in the state. (See the tables at the end of this appendix.)

There are 200 distinct disciplinary groups in allied health making it the most complex group of health professions. However, a 1988 Institute of Medicine study on allied health, *Allied Health Services: Avoiding Crises*, chose ten of the largest, most well-known of these professions:

- Clinical laboratory sciences
- Dental hygiene
- Dietetics
- Emergency medical personnel
- Medical records administration [now known as Health Information Management]
- Occupational therapy
- Physical therapy
- Radiologic technology
- Respiratory therapy
- Speech-language pathology/audiology

In Texas, using the same criteria as the IOM, the ten largest and most well-known allied health professions in 1998 were:

- Clinical laboratory Sciences
- Radiologic Technology
- Emergency Medical Technology
- Physical Therapy
- Dental Hygiene
- Speech-Language Pathology and Audiology
- Respiratory Therapy
- Medical Records Technology
- Physician Assistants
- Occupational Therapy

The Drivers of Change in Allied Health

Two major factors are driving change in the workplace of allied health--cost containment and technological change in health and medicine. These drivers directly affect the demand for allied health professionals and indirectly impinge on the educational programs and institutions that train such individuals.

Cost containment has often been discussed in recent years as a primary characteristic of managed care. But it also characterizes state government actions to limit state Medicaid obligations, Congressional efforts to constrain the growth of Medicare in the Balanced Budget Amendments of 1997 (as amended in 1999), and private employer efforts to hold down health insurance premium costs or to abandon health insurance for employees entirely. Cost containment is a permanent feature of the health care landscape.

Concurrently, new technology continues to reshape medicine and health. Medical devices and equipment influence the work of allied health professions perhaps more strongly than new pharmaceuticals influence the practice of medicine. For example, the technologies of imaging the body--ultrasound, computed tomography, magnetic resonance imaging--have undergone continuous technical change over two full decades, reshaping the demands for skilled technicians.

The effect of cost containment and technical change on the allied health workforce has been and continues to be profound. Employers of

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allied health professionals, necessarily, are engaged in a continuous search for lower-paid professionals, adequately trained and reasonably competent, on whom they can place increasing responsibility. Educating and training qualified personnel to meet these market demands is a challenging task.

Allied Health Education

There is no common educational level that best describes allied health's formal preparation.

- Graduates receive degrees for associate, baccalaureate, masters and doctoral degree programs.
- Graduates also receive certificates for completion of short courses of study.
- Some allied health professions have career ladders for their students and graduates; others do not.
- Some professions have various exit points as students progress through career stages.

There are approximately 4,500 allied health programs in the United States with an enrollment of 211,400 students and 91,000 graduates per year.

Allied health education programs are offered in many types of educational institutions, including high schools, vocational/technical schools, community colleges, four-year colleges and universities, hospitals, and academic health centers.

Accredited Programs by Type of Sponsoring Institution, 1997-98

Type of Institution	*Institutions*		*Programs*	
	Number	*Percent*	*Number*	*Percent*
Academic Health Center	102	3.6	465	8.0
Junior/Community College	644	23.0	1,805	31
Hospital:100-299 beds	231	8.2	124	2.1
Hospital:300-499 beds	297	10.6	208	3.6
Hospital:500 or more beds	231	8.2	305	5.2
Four-Year College or University	673	24	2,103	36
Vocational/Technical School	379	13.5	596	10.2
Other	247	8.8	227	3.9
Total	2,804	100	5,833	100

Almost all allied health professions are dependent on the health care industry for clinical sites to educate and prepare clinicians. The entirety of clinical education usually takes place in hospitals, clinics, doctor's offices, nursing homes, etc., that are under affiliation agreements with the educational institution. The clinical agencies do not receive payment for this service.

Allied health education programs have limited flexibility in meeting educational needs of the health care industry due to requirements of universities, the Coordinating Board, and accrediting agencies.

Similar to higher education in general, there is an increase in the number of distance learning programs offered by allied health education programs. The limitations of "service areas" and "state lines" placed on educational programs are blurring. Distance education increases access to allied health education for the "geographically challenged" student while at the same time intensifying the competition among institutions for students in a formula enrollment driven environment.

The growth of proprietary schools is reshaping the postsecondary educational landscape, including that of allied health. Proprietary schools typically have greater flexibility in changing curricula,

educate students in less time, better meet the needs of the student customer, and respond faster to the needs of the health care industry.

Historically, many allied health professionals have had to earn doctorates in a related field, such as education, administration, or a basic science, rather than their allied health field, primarily because there are very few programs at the doctoral level.

Programs at the master's level are either entry or advanced study beyond the entry-level credential with emphasis in such areas as research and clinical expertise.

There has been a "degree creep" in allied health. With the explosion of knowledge, diverse practice acts, etc., programs of study increasingly include requirements for higher-level degree programs. In some cases, the increased requirements are definitely needed; in other professions, they may be questionable.

Allied Health Faculty and Research Needs

There is a serious need for qualified faculty in allied health education. Faculty members are aging and few professionals are seeking education as a career choice.

There is a serious need for allied health professionals who can provide new scholarship and research in the allied health professions. There is a serious need for clinical researchers and researchers looking at clinical care outcomes.

The Allied Health "Regulatory" World

There are nine different specialized accrediting bodies that evaluate allied health programs. One of them, the Commission on Accreditation of Allied Health Education Programs, is an umbrella agency that is responsible for 18 different professions affecting 2,000 programs at 1,100 institutions. The nine accrediting agencies in allied health are:

- Accreditation Council for Occupational Therapy Education (ACOTE)
- Commission on Accreditation of Allied Health Education Programs (CAAHEP)

- Commission on Accreditation/Approval for Dietetics Education (CAADE) of the American Dietetic Association
- Commission on Dental Accreditation (CDA) of the American Dental Association
- Commission on Academic Accreditation (CAA) in Audiology and Speech-Language Pathology
- Commission on Accreditation in Physical Therapy Education (CAPTE)
- Joint Review Committee on Education in Radiologic Technology (JRCERT)
- Joint Review Committee on Educational Programs in Nuclear Medicine Technology (JRCNMT)
- National Accrediting Agency for Clinical Laboratory Sciences (NAACLS)

Educational programs have extremely limited flexibility in responding to changing market conditions due to the specific educational and curriculum requirements placed on them by accreditation agencies, university bureaucracies, and the Coordinating Board.

- Not all allied health professions require licensure for practice. Laws vary by state.
- State practice acts and scope of practice acts vary by state.
- Most allied health professions require successful completion of a national examination.
- Level of supervision by a physician, dentist, or other professional varies by state.
- Reciprocity to gain licensure from state to state is not always available.

The Allied Health Marketplace

The employers of allied health professionals include hospitals, clinics, laboratories, private offices and emergency medical systems.

Although allied health represents 60 percent of the health care workforce, very few federal dollars are targeted for allied health.

Some allied health professionals, are provide greater access to primary health care, such as the physician assistant, while others are employed in hospitals, clinics, home health agencies, long-term care facilities, schools, government agencies, military, etc.

Allied health professionals are increasingly accepting broader responsibilities in the workplace. Flexible career linkages across disciplines (multidisciplinary) are being designed and used in many patient care arenas.

Changes in reimbursement and Medicare policies have had a severe, negative impact on most allied health professions, especially speech, occupational, and physical therapy.

In efforts to contain costs, less well trained personnel at lower salaries are often replacing some allied health professionals. For example, Physical Therapist Assistants are replacing Physical Therapists, Medical Laboratory Technicians are replacing the Clinical Laboratory Scientists, and Respiratory Therapists are being replaced by Nurse's Aides.

Health Care Professions Error Management and Quality Improvement

Public attention has recently focused on the Institute of Medicine study, *To Err is Human*, which indicated the number of errors made by physicians and others in the health care industry. Following the IOM's recommendations, President Clinton is calling for a nation wide system of error reporting by all hospitals in the country.

In order to address error management and quality improvement in health care, however, a systems approach is needed. This requires a focus on the entire health care team and the recognition that error management efforts cannot be limited to physicians only. The entire team creates a "chain" of events that can lead to human error and it is the "chain" of professionals who can prevent error and improve the quality of care. Examples are below:

- The Blood Bank Specialist or the Clinical Laboratory Scientist (allied health professionals) cross matches and determines safety and compatability of blood for transfusion on the order

of the physician. The blood is typed and labeled by the Blood Bank Specialist and secured by a nurse or another health care professional to deliver to the bedside. By far, the majority of errors occurring in this chain of events is clerical.

- A study at UTHSCSA to determine the value of laboratory tests to diagnose hypercoagulability (the tendency to make blood clots) found that one-third of the tests were ordered by the physician at the wrong time and the physician did not order the appropriate test in 88 percent of the cases. In only 25 percent of the cases where a patient had a deficiency was there documentation made in the record. This suggests the need for physicians to consult with Clinical Laboratory Scientists on which tests to use and when to administer them. The rapid development of new knowledge and new tests makes it impossible for the physician to be aware of all new changes and underlines the importance of working in teams and using the expertise of all health care professionals.

Research indicates that allied health professionals can significantly improve the quality of patient care while reducing the cost of care both to the patient and to the payer. Examples include:

- A study using Health Care Financing and Administration (HCFA) data show that Medicare beneficiaries treated by a Respiratory Therapist (RT) during their initial stay in a Skilled Nursing Facility had a 42 percent lower mortality rate at their next encounter with the Medicare system than a similar group of beneficiaries who received respiratory care from non-RT providers. The study indicated that RTs saved Medicare approximately $98 million in 1996. HCFA data point to shortened length of stay by 3.6 days when Medicare patients received respiratory care by RTs.

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- Results of a six-year case study in a Georgia nursing home showed that after the introduction of the physician assistant, the number of annual hospital admissions fell by 38 percent and the total number of hospital days per 1000 patient years fell by 68.6 percent (from 4,170 in 1992 to 1,310 in 1997). The number of nursing home visits increased by 62 percent. Annual Medicare-allowed charges for MD and PA services increased by $22,304, but were more than offset by a decline in hospital DRG reimbursements of $96,043. The conclusion of the study was that introduction of regular visits to nursing home patients by a physician assistant can reduce hospitalization and medical costs of the frail elderly.
- Data from a Pediatric In-Home Asthma Disease Management Program at UTHSCSA resulted in significant reductions in school days missed, number and cost of physician office visits, emergency department visits, hospitalizations and Health Care Utilization Index.
- Another study published by UTHSCSA found that baccalaureate-degree respiratory therapy students are better prepared to identify and recommend appropriate treatment of lethal arrhythmias encountered in the clinical setting when compared with baccalaureate degree nursing students.
- A study to determine the appropriateness of basic respiratory care delivered at a 450-bed VA hospital during a three-month time interval found that, on average, 25 percent of basic procedures ordered were not indicated and about 12 percent of patients reviewed were not receiving care that was indicated. Inappropriate utilization of respiratory care services may increase costs and produce undesirable outcomes in terms of morbidity, mortality, and length of stay.
- In a study entitled "Effectiveness of Manual Therapy and Exercise of Osteoarthritis of the Knee," published in *Annals of Internal Medicine*, researchers at Brooke Army Medical Center found that a combination of manual physical therapy and supervised exercise by physical therapists is more effective

than no treatment in improving walking distance and decreasing pain, dysfunction, and stiffness in patients with osteoarthritis of the knee. Such treatment may also defer or decrease the need for surgical intervention.

Health Policy Needs

- There are no comprehensive educational and practice data sets on allied health.
- There are few health policy and health services researchers focused on allied health.
- There need to be changes in the regulation of allied health in the State of Texas, including licensure, scope of practice and university and state bureaucratic requirements.

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Allied Health Professionals Employed in the State of Texas

1998 Texas State Occupational Employment and Wage Estimates

Texas Bureau of Labor Statistics

Professional, Paraprofessional and Technical Allied Health Occupations

(alphabetically listed)

Occupation	Number Employed in Texas
All Other Health Service Workers	18,100
All Other Therapists	5,040
Dental Assistants	15,340
Dental Hygienists	7,360
Dietetic Technicians	1,310
Dietitians and Nutritionists	2,410
Electroneurodiagnostic Technologists	270
Emergency Medical Technicians	7,810
Home Health Aides	43,000
Medical and Clinical Laboratory Technicians	9,370
Medical and Clinical Laboratory Technologists	10,410
Medical Assistants	19,420
Medical Records Technicians	5,820
Nuclear Medicine Technologists	830
Occupational Therapists	4,610
Occupational Therapy Assistants and Aides	910
Opticians, Dispensing and Measuring	4,200
Orderlies and Attendants	44,115
Other Health Diagnosing and Treating Practitioners	830
Paraprofessionals and Technicians	37,250
Pharmacy Technicians and Aides	13,080
Physical and Corrective Therapy Assistant and Aides	5,390
Physical Therapists	7,740
Physician Assistants	4,750
Radiation Therapists	810
Radiologic Technologists	8,850
Recreational Therapists	1,200
Respiratory Therapists	6,120
Speech-Language Pathologists and Audiologists	6,450
Surgical Technologists and Technicians	3,890
TOTAL	**296,685**

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5. DATA ISSUES AND CONCLUSIONS

The March conference heard a presentation by Dr. Ben Rainer of the Texas Statewide Health Coordinating Council on data needs and capabilities related to health workforce and distribution of health professionals. Although relatively little time or attention was spent on this subject, it became clear that data deficits limited policy development in all areas of interest to this study.

The efforts of the Texas Medical Association and the Texas Nurses Association should be noted, however, because both organizations have seen fit to invest resources in generating data and analyses pertinent to many of the questions considered in this report. It is the case, however, that the state of Texas has seen fit to charge the Statewide Health Coordinating Council with responsibility for development of a state health plan with a workforce planning focus. The basic limitation of the Council is the lack of adequate resources to meet its charge. The Legislature, in establishing such an entity and charging it with such an important task, should provide adequate funds to see that data collection and analysis are well done.

One observation that emerges from the discussions with Texas health and health education representatives and from the presentations at the March conference is the importance of recognizing the strong connection between the issues of health professions education and the changes occurring in the health care financing and delivery system. These two domains are distinct but intersect, or overlap, in very fundamental ways, and an understanding of how they intersect is essential to the development of sound health education policy. In addition, there is a characteristic of these issues that is uniquely Texan, of which demographic growth and change is the primary manifestation. Securing a firm grip on those issues that are appropriately the property of the Texas Higher Education Coordinating Board is not necessarily a straightforward matter.

In that regard, the Board is structurally an agency of higher education and more strongly connected to higher education issues than health issues. Internal responsibility within the Board staff is divided between two divisions, each of which has a much broader agenda than health education and each of which is oriented to a different set of health education institutions. It is noteworthy that the three major academic health systems--the University of Texas, Texas Tech, and Texas A&M--have all chosen to organize health system activities separate from the other educational activities of their respective university systems.

Given how the three university systems have organized themselves, it is worth asking whether the Board should consider strengthening the resources it devotes to health education. Alternatively, it might consider organizing itself in a way that promotes greater internal coordination in the development of policies and programs and greater articulation with its external environment.

In substantive terms, no new four-year medical school is needed in Texas and thorough analysis of need should precede any effort to move in this direction. The full dimensions of a prospective nursing shortage need to be assayed and strategies designed to respond to it. More descriptive information is needed about allied health professions education if coherent, big picture policies are to be developed. Data needs for health workforce planning, physician distribution, and similar health education issues are easily recognized by many. Recognition of need should be matched by the Legislature with adequate financial resources for meeting those needs.

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